# III. AFFECTED ENVIRONMENT

## A. INTRODUCTION

A study area encompassing the Preferred Alternative was established for detailed studies. A larger, more regional area was evaluated for some socioeconomic matters and secondary and cumulative impacts. The studies examined the physical, biological, atmospheric, and socioeconomic environments in the study area and identified secondary and cumulative impacts from construction when appropriate.

## B. PHYSICAL AND BIOLOGICAL ENVIRONMENT

### 1. Geology and Soils
*a.    Geology*

The study area is on the east flank of the Kearsarge-Central Maine synclinorium, a broad northeast to southwest trending syncline that dominates south-central Maine (Osberg, et al. 1985). The sedimentary rocks of this area have metamorphosed and undergone several episodes of tectonic folding and faulting (Tucker, et al. 1988). Blanketing the bedrock is a highly variable layer of glacial sediments (Griffin 1976). Bedrock outcrops are present in the study area.

The predominant glacial sediment in the study area is till, which is an unstratified, heterogeneous mixture of sand, silt, clay and gravel that conforms to the bedrock surface. Thickness can be highly variable but is expected to be between 0 to 15.2 m (0 to 50 ft.) in the study area. Swamp and tidal marsh deposits are found at the western and southern ends of the study area to the immediate north of I-95 southbound. These deposits consist of peat, silt, clay, and sand and are poorly drained (Thompson 1977).

*b.    Soils*

Of 53 ha (130 ac.) in the study area, 22 ha (54 ac.) consists of hydric soils (Section A-5, Aquatic Habitat and Wetlands), while 22 ha (54 ac.) is classified as prime farmland (Section D-2, Prime and Unique Farmlands). There were no farmlands of statewide importance in the study area (USDA NRCS unpublished soil survey).

### 2. Water Resources
*a.    Groundwater*

A search of the Federal Reporting Data System (EPA, Office of Drinking Water) for a 1.6 km (1 mi.) radius of the study area identified 15 wells. The wells range in depth from 9.0 to 130 m (29.6 to 425 ft.), with the majority being less than 30.5 m (100 ft.) in depth. Six of the wells are listed as domestic; three are listed as stock; two are listed as commercial; and four are listed as not reported. Aquifer information was available for two of the 15 wells. These two wells are 0.8 km (0.5 mi.) southwest of the study area and draw from glacial sediments (EDR 1995). Public water and sewer facilities serve the study area and the majority of the surrounding areas.

Depth to groundwater in the study area is less than 4.5 m (15 ft.) (Caswell et al. 1978). Wetlands in the study area reflect the intersection of the water table with the ground surface. The direction of shallow ground flow is to the west-southwest, based on topography and the Penjajawoc Stream to the west of the study area.

*b.     Surface Waters*

No surface water bodies are within the study area. The Natural Resource Conservation Service (NRCS) soil survey maps indicate the presence of some intermittent streams or drainage ditches.

A field reconnaissance confirmed the absence of permanent surface waters in the study area. Intermittent waterways in the study area include a drainage ditch adjacent to Stillwater Avenue north of I-95 and an intermittent stream channel south of I-95 and east of Stillwater Avenue.

**3.     Vegetation**

The vegetation of the study area was mapped using 1:6000 aerial photography from April of 1992 and during the field reconnaissance. Vegetation in the study area consists of mixed upland forests, scrub-shrub areas, and grassy area (Table III-1).

Upland forests in the study area range from early successional areas to more mature mixed hardwood-conifer forests. Early successional forests are dominated by trees with heights averaging 9 to 12 m (30 to 40 ft.) and diameters at breast height (DBH) ranging from 10 to 25 cm (4 to 10 in). The more mature forests are dominated by the same species but tree height was typically 18 to 22 m (60 to 70 ft.) with DBHs of 20 to 36 cm (8 to 14 in).

Abandoned fields in the study area range in seral

**Table III-1, Vegetation**

| Common Name | Scientific Name |
|---|---|
| **Forested Areas** ||
| White Pine | Pinus strobus |
| Grey Birch | Begula populifolia |
| Red Oak | Quercus rubra |
| Quaking Aspen | Populus tremuloides |
| Black Locust | Robinia pseudoacacia |
| Yellow Birch | Betula alleghaniensis |
| Red Maple | Acer rubrum |
| Sugar Maple | Acer saccharum |
| Beaked Hazelnut | Corylus comuta |
| Northern Arrowwood | Vibumum recognitum |
| Green Briar | Smilax sp. |
| **Fields** ||
| Smartweed | Polygonum sp. |
| Goldenrod | Solidago sp. |
| Thistle | Cirsium sp. |
| Sneezeweed | Helenium sp. |
| Aster | Aster sp. |
| Wormwood | Artemesia sp. |
| Grasses | — |
| Red Clover | Trifolium sp. |
| Queen Anne's Lace | Daucus carota |

stage from very early successional stages (dominated entirely by grasses), to late stages with scrub-shrub vegetation. Some grass-dominated fields appear to receive at least occasional mowing. Most fields are dominated by a variety of broad-leaved herbaceous vegetation plus grasses.

## 4. Wildlife

Observations on the presence of wildlife were made during site visits in September 1995.

The Maine Department of Inland Fisheries and Wildlife (MDIFW) defines two types of special wildlife habitat: essential habitat and significant habitat. Essential Habitats are defined as "… areas currently or historically providing physical or biological features essential to the conservation of an endangered or threatened species in Maine and which may require special management considerations." According to MDIFW records, there are no essential habitats known to be associated within the study area.

Significant Wildlife Habitats are defined by the NRPA as:

- Habitat for state and federally listed endangered and threatened species.
- High and moderate value deer wintering areas and travel corridors.
- High and moderate value waterfowl and wading bird habitats, including nesting and feeding areas.
- Shorebird nesting, feeding, and staging areas.
- Seabird nesting islands.

According to MDIFW records there is one "candidate" significant wildlife habitat partially located within the study area. The "candidate" significant wildlife habitat is a paulstrine, forested, broad-leafed deciduous, seasonally saturated, and flooded wetland. A total of 0.12 ha (0.3 ac) of state designated "candidate" significant wildlife habitat is in the western portion of the study area north of I-95.

The habitat in the study area consists predominately of upland grassed areas, within the median and adjacent to the travel lanes of I-95, with scattered scrub-shrub and mature deciduous wooded areas to the north and south of the I-95 right-of-way (Section B-3, Vegetation). Five areas of wetlands exist in the study area (Section B-5, Aquatic Habitat and Wetlands).

The types of wildlife expected to use the habitats in the study area would be those species accustomed to living in proximity to commercial and residential development. Observations of wildlife in the study area included snowshoe hare *(Lepus americanus)* and white-tailed deer *(Odocoileus virginianus)*.

## 5. Aquatic Habitat and Wetlands

The MDIFW reported that no critical fish habitats within the study area.

Wetlands in the study area were preliminarily identified using National Wetland Inventory (NWI) maps. The *Penobscot County Soil Survey* was reviewed to establish the presence and location of hydric soils.

The NWI maps indicate one wetland within the study area: a palustrine, forested, broad-leafed deciduous, seasonally saturated, and flooded wetland north of I-95 on the western portion of the study area, which is part of a larger wetland complex.

The *Penobscot County Soil Survey* indicates four hydric soil series within the study area including: Biddeford mucky peat (BoA), Burnham silt loam (BrA), Lamoine, Scantic and Biddeford very stony silt loam (BxB), and Scantic silt loam (ScB). Burnham silt loams are found on glacial till while the other three hydric soil types are derived from a parent material of glaciofluvial material.

The MDOT performed field work to delineate wetlands in the study area during the Spring and Summer of 1995. Wetland boundaries were adjusted based on agency input from the U.S. Army Corps of Engineers and Maine DEP. The wetland boundaries were subsequently located through field survey.

Five wetlands were identified and delineated in the study area (Figure III-1). Wetlands were delineated in accordance with the *U.S. Army Corps of Engineers Delineation Manual* (1989). Wetlands were classified according to the U.S. Fish and Wildlife Service's *Classification of Wetlands and Deep Water Habitats of the United States* (Cowardin et al., 1979). Wetland descriptions are provided in Table III-2.



*Figure III-1, Wetlands location map                     Not to scale*
*Note: Wetlands 1 and 4 extend beyond the study area boundary.*

Qualitative values were assigned to wetlands based on the functions performed in the surrounding environment. A checklist of eight wetland functions and five wetland values ("New England Method") from the U.S. Army Corps of Engineers (USACOE), *New England Division, Highway Methodology Workbook Supplement (November 1995)* were used to indicate relative functions and values (Table III-3).
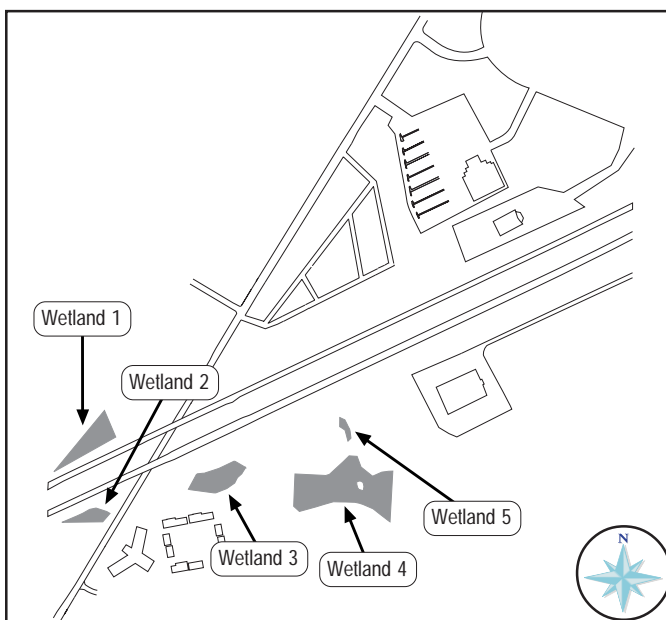
### 6.    Floodplains
According to the U.S. Dept. of Housing and Urban Development, there are no floodplains in the study area.

### 7.    Threatened and Endangered Species
According to the United States Fish and Wildlife Service (USFWS) there are no federally listed or proposed, threatened and endangered species under their jurisdiction that are known to occur in the study area, with the exception of occasional

**Table III-2, Wetland Descriptions**

| Wetland | Cowardin Classification | Size ha (ac) | Dominant Vegetation | Wetland Hydrology Indicators |
|---|---|---|---|---|
| Wetland 1 | PEM/SS1E | 18.9 (46.7) | Reed canary grass, cattail, speckled alder, willow | Small open water areas, linear depressions (dried stream channels) |
| Wetland 2 | PEM/SS1E | 1.0 (2.4) | Pipewort, meadow sweet, purple loose strife | Ponded water |
| Wetland 3 | PSS/FO1E | 0.3 (0.8) | Speckled alder, meadow sweet, gray birch, quaking aspen, sensitive fern | Small ponded area, water stained leaves |
| Wetland 4 | PEM/SS1E | 4.0 (9.9) | Cattail, willow, red maple, speckled alder | Ponded water |
| Wetland 5 | PFO1C | 0.03 (0.1) | White pine, gray birch, wither-rod, northern arrowwood | Mounds and pools, water stained leaves |

transient bald eagles or peregrine falcons. The USFWS stated that the preparation of a biological assessment or further consultation under Section 7 of the Endangered Species Act is not required for this project.

Maine agencies with jurisdiction over threatened and endangered species responded that there were no known listed or proposed rare, threatened or endangered plant or animal species, or registered critical areas within the study area.

**Table III-3, Wetland Functions**

| Wetland | Wetland Functions |
|---|---|
| Wetland 1 | Groundwater recharge/discharge, floodflow alteration, sediment/toxicant retention, wildlife habitat |
| Wetland 2 | Floodflow alteration, sediment/toxicant retention, nutrient removal, production export, wildlife habitat |
| Wetland 3 | Wildlife habitat |
| Wetland 4 | Groundwater recharge/discharge, floodflow alteration, wildlife habitat |
| Wetland 5 | No functions identified. Wetland is a small, isolated depression which is too small to perform functions. |

## C. ATMOSPHERIC ENVIRONMENT

### 1. Air

The Federal Clean Air Act Amendments of 1990 established National Ambient Air Quality Standards (NAAQS), which transportation projects must meet. A microscale analysis of carbon monoxide (CO) concentrations was performed as the accepted indicator of vehicle-generated air pollution. The one-hour NAAQS for CO is 35 parts per million (ppm); the eight-hour NAAQS is 9 ppm. Existing and proposed peak hour CO levels were predicted using EPA's CAL3QHC computer model and emission factors generated by the EPA's MOBILE5a(H) computer model. Input used in these models reflect worst case meteorological (i.e., wind speed, wind

direction, stability class, etc.) conditions and traffic data and reflect assumptions based on conversations with the MDEP Air Bureau Section. A background concentration of 4.0 ppm was used (MDEP 1997).

The CAL3QHC model was used for 11 sites in the vicinity of the proposed interchange and around the I-95/Hogan Road interchange (Table III-4). Concentrations in the study area result from both free flow traffic as well as vehicles idling within traffic queues at signalized intersections in the area.

**Table III-4, Summary of Existing (1998) 1-Hour and 8-Hour Worst-Case CO Concentrations**

| Receptor | Land Use | Location | 1-Hour (ppm) | 8-Hour (ppm) |
|---|---|---|---|---|
| R1 | Commercial | SE Corner of Hogan and I-95 NB Off-Ramp | 8.6 | 4.2 |
| R2 | Commercial | NW Quadrant of Hogan/I-95 Interchange | 6.4 | 3.2 |
| R3 | Commercial | N of Hogan/I-95 Interchange SB Off-Ramp | 9.2 | 4.5 |
| R4 | Commercial | W of Hogan/I-95 Interchange NB On-Ramp | 7.8 | 3.8 |
| R5 | Commercial | NW Corner of Hogan/Springer Intersection | 11.1 | 5.4 |
| R6 | Commercial | NE Corner of Hogan/Springer Intersection | 13.9 | 6.8 |
| R7 | Residence | W of Stillwater, N of I-95 | 5.4 | 2.7 |
| R8 | Residence | W of Stillwater, SW of Proposed Ramp | 5.1 | 2.5 |
| R9 | Healthcare | E of Stillwater, S of I-95 | 4.8 | 2.4 |
| R10 | Residence | E of Stillwater, S of Proposed NB Off-Ramp | 5.2 | 2.6 |
| R11 | EMTC | E of Proposed I-95 NB Off-Ramp | 5.5 | 2.7 |

NAAQS for Carbon Monoxide = 35 ppm (1 hour), 9 ppm (8 hour).
All values include background concentration of 4 ppm.
All 1-Hour values assume Stability Class F conditions; 2.5 mps wind speed; worst case wind angle.

**2. Noise**

To determine if highway noise levels are compatible with various land uses, the FHWA has developed noise abatement criteria and procedures to be used in the planning and design of highways (Table III-5).

**Table III-5, FHWA Noise Abatement Criteria** Hourly A-Weighted
Sound Level — Decibels (dBA)

| Activity Category | Leq(h) | Description of Activity Category |
|---|---|---|
| A | 57 (Exterior) | Lands on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. |
| B | 67 (Exterior) | Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries and hospitals. |
| C | 72 (Exterior) | Developed lands, properties or, activities not included in categories A or B above. |
| D | — | Undeveloped lands. |
| E | 52 (Interior) | Residences, motels, hotels, public, meeting rooms, schools,churches, libraries, hospitals, and auditoriums. |

Source: *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, 23 Code of Federal Regulations (CFR) Part 772; December 1991

Ambient noise measurements were taken on August 30 and 31 and September 1, 1995 to quantify the existing acoustic environment and to calibrate the noise model.

The hourly Leq, or equivalent sound level, is the level of constant sound which in an hour would contain the same acoustic energy as the time-varying sound (the fluctuating sound levels of traffic noise are represented in terms of a steady-state noise level of the same energy content). Residential units are classified as FHWA Noise Abatement Criteria (NAC) Category B (residential), with the technical school building (Receptor SER20) and the healthcare facility (SER 1HC) classified as FHWA NAC Category E (interior). Commercial facilities, including the cinema and restaurant, are classified as FHWA NAC C.

Existing peak hour noise levels were predicted using the FHWA Traffic Noise Model (Table III-6).

**Table III-6, Summary of Existing (1998) Noise Levels**

| Receiver(s) | NAC Category | NAC Leq (h) | Leq Noise Levels (dBA) |
|---|---|---|---|
| SER1HC - Healthcare | E | 52 | 43.7 |
| SER2 -SER19 Residences | B | 67 | 54.8 - 68.6 |
| SER20 - EMTC | E | 52 | 40.3 |
| Tech School Gym | E | 52 | 30.4 |
| NW1 - NW12  Residences | B | 67 | 50.1 - 70.1 |
| Cinema (C) | C | 72 | 62.8 |
| Restaurant (C) | C | 72 | 57.9 |

## D.  LAND USE, HISTORIC AND SOCIOECONOMIC ENVIRONMENT

### 1.  Land Use

This section discusses the land use, zoning, and planning issues within the study area and, when needed to provide context, within the larger mall area.

*a.  Land Use and Planning Concepts of the Mall Area*

The study area is within a larger area referred to as the mall area. Land use characteristics of the mall area were inventoried using 1992 aerial photography, the Bangor planning department 1989 inventory of existing land uses, and a field reconnaissance of the area. The mall area in this document corresponds roughly with the "Bangor Mall Study Area" defined in the *BACTS Major Street and Highway Study* (1991) and with the "Bangor Mall Area" as examined in the city's 1990 *Comprehensive Plan Update*.

Commercial land use dominates the mall area, with nearly 185,800 m² (2.0 million sq. ft.) in place (City of Bangor 1995). The mall area contains two existing office parks, and one planned office park. Several individual offices are in the mall area. The only industrial facility in the area is on Sylvan Road. Institutional uses are another major feature of the mall area; education and health care facilities are in the southern portion of the mall area.

Residential land use is concentrated in the southwestern portion of the mall area. Most of the residential developments are older communities that were in existence before the surge of retail development. Single family units dominate the residential character in the area to the south of I-95.

Undeveloped lands include forest, pasture, transitional rangelands, and lands cleared for prospective development. Forested lands are south of the buildings on Sylvan Road, on Kittredge Road, and along the Penjajawoc Stream. Agricultural uses are found west of Stillwater Avenue and are limited to production of hay or similar crops. No agricultural production takes place in the project area.

The *Bangor Comprehensive Plan Update* of June 1990 identifies the city's plans for future land use patterns. The plan includes a growth management strategy, which involves service area and land use projections to manage future development. Several tools are used to further this strategy. First, the plan identifies an *urban growth boundary* — a limit of urban development over the long-range projections of the plan. The boundary is the basic dividing line between areas planned for eventual urban uses and areas intended to remain rural. The project area lies within the urban growth boundary and is intended for urban uses in the future.

The next tool cited in the plan, the *primary service area* (PSA) concept, is a principle for guiding growth over the short-term. The PSA includes areas that are currently or can easily be serviced with public water and wastewater, fire protection, highway access, transit service, and utility services. Areas within the PSA are, by this definition, currently positioned to support urban development.

The final growth management strategy is the *land use concepts map*. This map assigns general land uses to those developable areas within the urban growth boundary. Lands within the project area are intended for commercial development, with inclusions of institutional, low density residential, rural, and open space uses.

Land development is affected by the Maine Site Location of Development Law, (38 Maine Revised Statutes Annotated (M.R.S.A.) 481-490). This legislation, implemented by the Maine DEP, sets standards for the location of developments that may affect the environment and quality of life. These standards include consideration of the natural environment, infrastructure, flooding potential, water resources, and traffic movement. Traffic circulation on Hogan Road generally operates below acceptable standards (MDOT 1995). Accordingly, new developments, which will potentially add traffic to the area, have been required to provide some type of compensation, either through physical improvements or payment of fees to the City to improve traffic circulation. Several of the recently developed retail establishments have contributed funds for roadway improvements to gain development approval. Because engineered improvements to existing facilities have been used to their maximum effectiveness at the Hogan Road-Springer Drive intersection, future development proposals in the area may not receive approval due to continued traffic concerns (Maine DEP 1995, City of Bangor 1995).

*b.* *Land Use and Zoning in the Study Area*

Existing land use within and immediately adjacent to the study area was mapped according to the Anderson Level II Categories (U.S. Geological Survey, 1976). Land uses within the study area include commercial, residential, transportation, and institutional uses (Figure III-2).

The Bangor zoning map depicts the land use policies of the comprehensive plan to guide land use and development in a logical, coordinated manner. In the study area, five zoning categories are used to implement the policies of the city. The majority of the lands within the study area are included in the *shopping and personal services* and *general commercial and services* categories. These zoning districts provide for a variety of commercial ventures including planned centers (e.g., malls, shopping plaza) and auto sales or big-box retail.



*Figure III-2, Land use map*                    *Not to scale*

| Map Legend — Anderson Level II Classifications | |
| --- | --- |
| Number | Classification |
| 11 ................................ Residential |
| 12 ................................ Commercial & Service |
| 14 ................................ Transportation |
| 32 ................................ Shrub & Brush Rangeland |
| 33 ................................ Mixed Range |
| 43 ................................ Mixed Forest Land |

Education facilities in the study area are included in the *government and institutional services district* (G & ISD) zoning classification. This zoning designation attempts to preserve and protect public and nonprofit institutional buildings.

Two residential zoning districts are in the study area, *high density residential* and *low density residential*. The *high density residential* zone applies to a variety of group housing, including health care and apartment complexes.

## 2.    Prime and Unique Farmland

No active farmland is present within the study area. According to the NRCS, approximately 22 ha (54 ac) of prime farmland soils are present in the study area. No unique soils or soils of statewide importance are in the study area.

The Federal Farmland Protection Policy Act (FPPA) of 1981, as amended, was enacted to minimize the extent to which federal programs contribute to the irrevers-

ible conversion of farmland to nonagricultural uses. The act applies to farmland with soil types classified as prime, unique, or of statewide or local importance, but not to farmland already in or committed to urban development or water storage.

As defined in the FPPA, farmland "committed to urban development or water storage" includes all such land with a density of 30 structures per 40 ac. area. Due to its location in the highly developed and disturbed area surrounding the interchange, the area was determined to meet the definition of farmland "committed to urban development or water storage". Under the FPPA, no further analysis is required.

**3.    Community Facilities and Services**
*a.    Educational Facilities*
Rangeley Hall, part of the Eastern Maine Technical College, is in the eastern portion study area at the western terminus of Sylvan Road. This building is used for student and community educational programs and for meetings and conferences.

*b.    Religious Facilities*
No places of worship are in the study area.

*c.    Emergency Services*
No emergency service facilities are in the study area.

*d.    Health Care Facilities*
Two health care facilities are within and immediately adjacent to the study area. Acadia Hospital, a mental health center, and Stillwater Health Care, a nursing home, are on Stillwater Avenue south of I-95.

*e.    Transportation Services*
Bangor operates a public transit system known as "The Bus". The Bangor-Mount Hope route provides bus service to the mall area, Stillwater Avenue, Hogan Road, and other businesses, and institutions near the study area. According to the Bangor comprehensive plan, this route has the second highest ridership of all city bus routes, accounting for over 20% of the total system ridership.

*f.    Public Water and Wastewater Service*
The city provides wastewater service to the study area. The Bangor Water District supplies public water service to the study area. Two water storage tanks are near the study area: one on Essex Street and one near the Essex Street Recreation Area.

*g.    Governmental Facilities*
No government facilities are in the study area.

*h.    Pedestrian and Bicycle Use*
Within the study area, pedestrian and bicycle paths are used by residents to access local commercial and institutional facilities. Safe and efficient pedestrian and bicycle circulation within this busy area of the city are an important consideration.

Currently, the only facilities devoted to pedestrian circulation within and adjacent to the study area are the sidewalks on existing streets. This includes both sides of Stillwater Avenue from Pine Street to Howard Street, the east side of Stillwater Avenue from Howard Street to Bangor Mall Boulevard, and throughout many of the residential neighborhoods adjacent to Stillwater Avenue. There are no dedicated bicycle paths in the study area.

The Bangor comprehensive plan sets several policies for improving and expanding pedestrian and bicycle facilities. In a community survey conducted in 1989 for the comprehensive plan update, residents generally responded as being "very dissatisfied" with the level of streets and sidewalks within the city. In response to these concerns, several policies were developed in support of this goal. These policies include:

- Implementation of a pedestrian sidewalk system on major streets and in residential areas.
- Establishment of a program to widen pavement and designate pedestrian/bike lanes on existing major arterial streets that lack sidewalks.
- Upgrade of existing sidewalks in developed areas.
- Provisions for clearly marked and properly designed interconnections between various automotive, pedestrian, and other pathways in the city that are handicapped-accessible.

The *Draft BACTS Regional Pedestrian and Bicycle Circulation Plan* (Deluca-Hoffman Associates, Inc. et al. 1994) represents the latest attempt to promote and improve non-motorized circulation within the greater Bangor area. The plan was developed in response to transportation-related legislation and increased community interest in pedestrian and bicycle use. The objectives of the plan are to prioritize circulation routes, provide linkages with existing facilities, and include consideration of pedestrians and bicyclists in the construction of roadways. The BACTS plan makes recommendations for new and improved facilities within the study area. Emphasis is placed upon extension or creation of sidewalks for pedestrian use and establishment of designated road shoulders for bicycle circulation in the study area. Stillwater Avenue, from Broadway to the Bangor Mall, has been placed in the highest priority category for bicycle improvements.

### 4. Neighborhood and Community Cohesion

The study area contains a variety of residential neighborhoods and housing complexes which are interspersed among the many commercial and institutional uses.

In the southeast quadrant of the study area, two apartment complexes (Park East Apartments and The Willows) and a nursing home (Stillwater Health Care) are located along Stillwater Avenue. These facilities are included in a high-density residential zoning district and consist of multi-family housing complexes. The Willows apartments are a financially-assisted community. Each of these communities has direct or indirect access to Stillwater Avenue.

In the southwest quadrant of the study area, a small neighborhood of single-family dwellings (Stillwater Park) is located along Stillwater Avenue. This neighborhood is comprised of many elderly residents. Access to the neighborhood is directly from Stillwater Avenue.

Residential uses in the study area north of I-95 include the Queen City Mobile Home Park and the Stillwater Gardens subdivision. Access to these neighborhoods is from Stillwater Avenue and Drew Lane. These neighborhoods are comprised of single-family dwellings on the west side of Stillwater Avenue.

**5.    Environmental Justice**

Environmental justice has been defined by the U.S. EPA's Office of Environmental Justice (EPA 1997) as "… the fair and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies."

No minority populations have been identified in the study area. A state subsidized low-income housing development is in the southern portion of the study area adjacent to a portion of I-95.

**6.    Business Activity Levels**

The City of Bangor has traditionally been a regional center for retail, wholesale, distribution, medical, professional, banking, transportation, and other services. Bangor serves as a primary shopping and employment center for an area encompassing a 32 km (20-mi.) radius and nearly 100,000 people. The city's secondary markets include other counties in eastern and northern Maine whose residents regularly frequent Bangor for major shopping and other services. Bangor's tertiary market extends to Atlantic Canada and the eastern portions of Quebec, encompassing a population of over three million people who may visit for shopping and other services or use the transportation and distribution services in the city (City of Bangor 1990).

When I-95 was constructed in the early 1960s, the mall area was predominantly rural. Since then, the I-95/Hogan Road interchange area has become an attractive location for retail and service establishments. Commercial development of the area progressed at a conservative rate until the opening of the Bangor Mall in 1977. Development was intensive through the 1980s; between 1977 and 1989, the floor area devoted to retail and service sector establishments increased from 10,648 to 94,958 m$^2$ (114,615 to 1,022,152 ft.$^2$). Today, nearly 185,800 m$^2$ (2.0 million ft.$^2$) of commercial floor area are in place (City of Bangor 1995).

The trade and service establishments in the Bangor Mall area are a very important component of the city's economy, contributing property tax revenue to city government and employment and income to area residents. The mall area's eco-

nomic role is especially important considering that the area draws money from outside the Bangor economy and does not represent simply a distribution of spending within the Bangor economy. The full market growth potential of the mall area does not appear to be realized, as suggested by the high occupancy rates of leases in the area.

### 7. Employment

Employment totals for each industrial sector in the Bangor Metropolitan Statistical Area are shown in Figure III-3. The most striking feature of the figure is the tremendous growth in employment in the service sector; services rose from the smallest sectors in 1970 to the single largest sector in 1994. Ten of the City's twenty largest employers are service establishments. Employment in wholesale and retail trade has risen considerably since 1970. Both the manufacturing and transportation and utilities sectors have experienced employment declines since 1970.
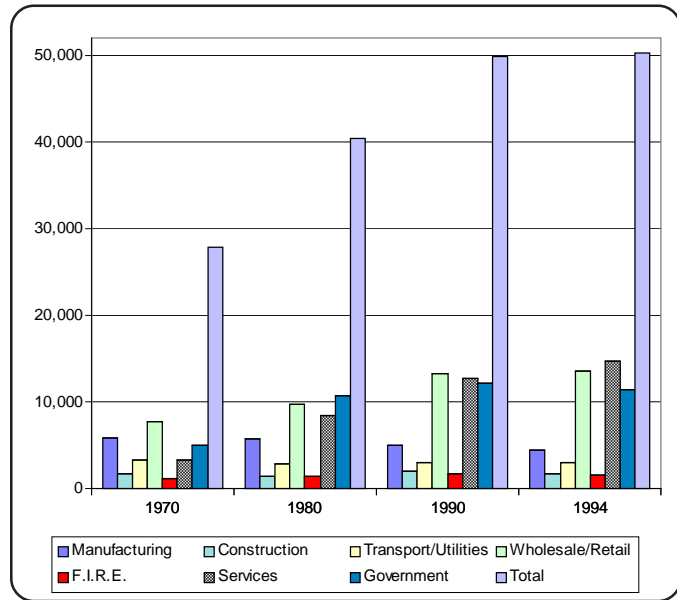


*Figure III-3, Employment totals by sector*

The area's economic performance since 1980, as reflected in the unemployment rate data has roughly mirrored the pattern at the state level. Unemployment generally declined from 1980 through 1988 and increased between 1989 and 1991. Since 1991, the Bangor area economy has fared better than the state overall, as measured by the unemployment rate. With one exception in 1986, the Bangor unemployment rate has remained below the state average rate from 1980 to 1994. Overall, the total non-farm employment data and the unemployment rate data paint a fairly positive picture of the Bangor area economy.

### 8. Historic and Archaeological Sites

According to the Maine Historic Preservation Commission (MHPC), there are no historic or archaeological sites or resources within the study area.

### 9. Public Parks and Recreations Lands

There are no public parks and recreational facilities within the study area. ATV trails and an ice skating area were observed on two privately-owned vacant properties immediately west of Rangeley Hall.

### 10. Uncontrolled Petroleum and Hazardous Wastes

A search of government waste-related databases and field views of the study area were performed to determine the possibility of uncontrolled petroleum and hazardous waste contamination in the study area (EDR, 1995).

The database search consisted of queries to more than 20 databases pertaining to federal or state waste-related activities. One property in the study area was identified in the state of Maine leaking underground storage tank (LUST) database.

The results from the field views suggest three properties may be of concern because of their contamination potential. However, results of the database search indicate that one of these properties has no potential for underground storage tanks, limiting the possibility of contamination from this property. No signs of illegal dumping in or near the study area were observed.

### 11. Traffic

The primary roadways in the study area are I-95 and Stillwater Avenue. The design hour traffic volumes on I-95 in the study area are the same as those on I-95 to the south of Hogan Road (Section II-D-1, The No-build Alternative). Stillwater Avenue is classified as a thoroughfare (City of Bangor 1989) and serves as the primary connection between the Bangor Mall area and the downtown portion of the city (Figure III-4). The residential streets fronting on Stillwater Avenue in the study area are Drew Lane and Howard Street.
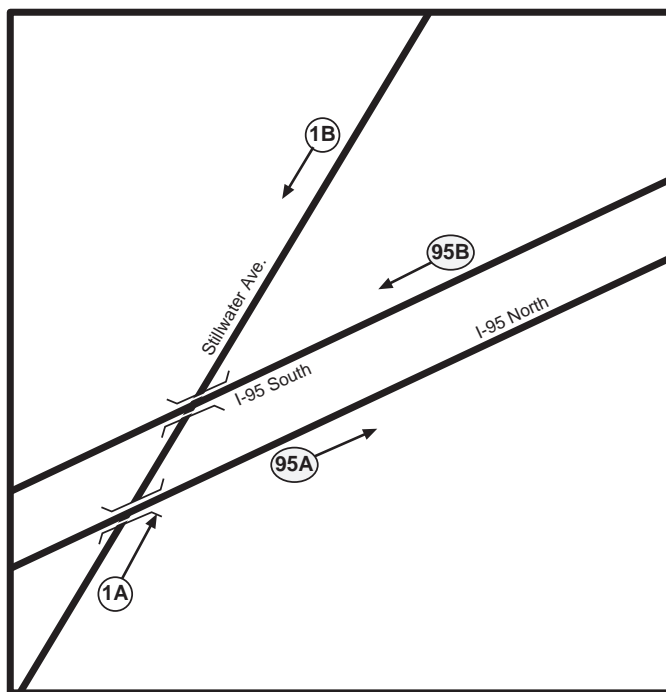


| Movement | 2005 | 2025 |
|----------|------|------|
| 1A | 944 | 1,278 |
| 1B | 1,062 | 1,352 |
| 95A | 2,682 | 2,565 |
| 95B | 2,747 | 3,588 |

*Figure III-4, No-build design hour traffic volumes on Stillwater Avenue and I-95*

### E. SECONDARY AND CUMULATIVE IMPACTS

A secondary impact from an action is one that is caused by the action, is later in time or farther removed in distance from a direct impact, but is still reasonably foreseeable. The Preferred Alter-

native will have the secondary effect of inducing land development resulting in economic and environmental impacts. Construction of an interchange is a necessary condition for the continued commercial growth in the mall area.

Cumulative effects are those which result from the incremental consequences of an action when added to other past and reasonably foreseeable future actions. Projects identified which may add to the impact of the proposed action include improvements to the intersection of Kittredge Road and Stillwater Avenue widening of I-95 through the study area, and the preliminary plans for a service road parallel and northwest of Stillwater Avenue.